

## Facts about the California Air Resources Board's WASTE COLLECTION VEHICLE REGULATION

The California Air Resources Board (ARB) is moving ahead with implementation of a regulation that will achieve tremendous public health benefits by reducing toxic particulate matter (PM) emissions from the states approximately 12,000 diesel-fueled commercial and residential solid waste and recycling collection vehicles. The ARB is taking this action as part of its continuing mandate to reduce diesel PM following the Board's 1998 identification of diesel PM as a health-damaging toxic air contaminant. Solid waste collection vehicles are the second group slated for PM reduction, having been preceded by transit buses in 2000, with more diesel vehicle and engine groups to follow. Depending on the age and type of trucks in an owner's fleet, implementing the regulation can average from \$3,000 to more than \$50,000 per truck. That being the case, in passing the regulation, the ARB stated it intends and expects municipalities and service providers to work together to amend or renegotiate contracts as needed so service fees reflect the service providers costs for compliance. ARB staff estimates that statewide the regulation's costs will average out to approximately \$1 per household per year.

### WHO IS RESPONSIBLE FOR COMPLYING WITH THE MEASURE?

The rule applies to owners of solid waste collection vehicles or those diesel-fueled trucks over 14,000 pounds gross vehicle weight with model-year engines from 1960 to 2006 used to collect residential and commercial solid waste. An owner can be a private company operating independently or under contract to a city or county, or a city, county, state or federal agency that directly operates refuse and recycling collection services. All are required to clean up their solid waste collection vehicles by using what the ARB defines as the Best Available Control Technology (BACT) for reducing diesel PM.

### WHAT TECHNOLOGY HELPS ACHIEVE BACT?

The ARB continues to verify technology that can help diesel engines meet the appropriate BACT standard through the addition of an ARB verified diesel emission control strategy (DECS). Currently, staff has certified several add-on technologies that will help waste collection truck engines meet BACT standards. There are three levels of these ARB-verified diesel emission control strategies:

**LEVEL 1** reduces diesel PM at least 25 percent.

**LEVEL 2** reduces diesel PM at least 50 percent.

**LEVEL 3** reduces diesel PM by 85 percent or more, or reduces emissions to at least 0.01 g/bhp-hr.

In addition, some strategies are also verified to reduce oxides of nitrogen (NOx) emissions. Many of the currently verified strategies require the use of ultra-low (<15 parts per million) sulfur diesel fuel. As stated previously, the BACT chosen always must reduce the engine's PM by the highest level possible. Once a particular DECS is selected and the engine is brought into compliance, it must stay in compliance as long as it is used in California. For more Information on these technologies please see the web pages listed at the end of this fact sheet.

### WHAT IS BACT?

BACT is ARB-verified technology that best reduces PM emissions from the diesel engine of a solid waste collection vehicle\*. Since one BACT does not work for all engines, the ARB has provided owners with several options to bring their vehicles into compliance. BACT is defined in the rule as one of four options:

- An engine alone certified to the 2007 model year standard of 0.01 gram of PM per brake horsepower-hour (g/bhp-hr), for example a new truck purchased beyond 2007.
- An engine certified to the existing 0.10 g/bhp-hr PM standard that is then equipped with the most effective ARB-verified Diesel Emission Control Strategy (DECS) such as a diesel particulate filter or diesel oxidation catalyst, for example replacing a 1990 truck engine with a 1994 engine plus DECS.
- An alternative-fuel engine, such as one that runs on natural gas.
- Any diesel or dual-fuel engine retrofitted with an ARB-verified DECS that reduces PM by the greatest amount possible for the particular engine and application. The right DECS for an engine depends on three things: the DECS is verified for the engine; the duty cycle of your vehicle matches the requirements of the DECS; and your engine warranty can not be voided by using the DECS.

\*Title 13 Section 2700 et seq.

## WHAT IS THE IMPLEMENTATION SCHEDULE?

Owners must apply BACT on their engines between 2004 and 2010, with specific deadlines depending on factors such as engine model year, number of vehicles in a fleet, and whether the fleet has dual-fuel or bi-fuel engines. ARB's Executive Officer can also grant specific extensions and exemptions based on a variety of situations. The table to the right shows compliance deadlines.

## PUBLIC HEALTH AND ENVIRONMENTAL BENEFITS

The health and environmental benefits of this measure are substantial. The rule will achieve a reduction in toxic PM emissions from collection vehicles by as much as 81 percent by 2010 and 85 percent by 2015 from levels that existed in 2000. This means that more than two million pounds of PM and 30,000 tons on NOx will not be released into the air. It is estimated that 80 premature deaths will have been prevented by the year 2020. The benefit will be most effective in the heart of residential communities, where waste collection is a weekly event, and in some cases served by three collection vehicles each week.

## COSTS

Owners will see a range of costs to implement BACT on their vehicles. Generally, newer trucks and engines will be less expensive to implement while older ones will be more expensive. For example, owners are most likely to retrofit 1991-2006 engines with a passive diesel particulate filter or a diesel oxidation catalyst. Using a PM filter would cost approximately \$5,000 to \$8,000, which includes the filter, installation and a backpressure monitor. A catalyst, which does not require a backpressure monitor, would cost about \$3,000 to \$4,000, including installation.

Collection vehicles older than 1991 will likely need to be fitted with a newer engine (repowered) to bring them to the point where most can meet the PM requirement through installation of a catalyst or filter, unless new technology is verified to work with a wide range of these older engines. The average cost for a repower is about \$45,000, with a range of \$21,000 to \$90,000, depending on engine manufacturer, model and model year. A catalyst or filter brings the total average cost to about \$50,000. However, it should be noted that a vehicle with a new 2007 diesel engine or an alternative fuel engine meets BACT standards without the need for additional retrofitting. This includes purchasing new trucks from 2007 and thereafter.

Some vehicle owners may experience higher or lower costs, depending on the age of their vehicles, how many already use alternative fuels, and the mix of BACTs needed for implementation. The state expects that waste haulers will recover reasonable costs of implementing this regulation through negotiations with municipalities for rate increases or through other means if they are available. ARB staff estimates that the regulation's costs will average out to approximately \$1 per household per year.

## IMPLEMENTATION BY ENGINE MODEL YEARS

Group 1**	1988-2002	DEADLINE
	10%BACT	December 31, 2004
	25%BACT	December 31, 2005
	50%BACT	December 31, 2006
	100%BACT	December 31, 2007

  

Group 2a*	1960-87	(Fleets of 15 or more vehicles)
	15%BACT	December 31, 2005
	40%BACT	December 31, 2006
	60%BACT	December 31, 2007
	80%BACT	December 31, 2008
	100%BACT	December 31, 2009

  

Group 2b**	1960-87	(Fleets of 14 or fewer vehicles)
	25%BACT	December 31, 2007
	50%BACT	December 31, 2008
	75%BACT	December 31, 2009
	100%BACT	December 31, 2010

  

Group 3**	2003-06	(includes dual & bi-fuel engines)
	50%BACT	December 31, 2009
	100%BACT	December 31, 2010

\*GROUP 2a: level1 technology may not be used as BACT.

\*\*Owners with total fleets of 1-3 vehicles may delay compliance until the final deadline for each group.

## MORE INFORMATION

For more information about the waste collection vehicle regulation you can visit the following ARB web page:  
[www.arb.ca.gov/msprog/swcv/swcv.htm](http://www.arb.ca.gov/msprog/swcv/swcv.htm) .

You can view and download regulatory documents, when available, at:  
[www.arb.ca.gov/regact/dieselswcv/dieselswcv.htm](http://www.arb.ca.gov/regact/dieselswcv/dieselswcv.htm) .

Additional information about verified Diesel Emission Control Strategies (DECS) is available at:  
[www.arb.ca.gov/diesel/verdev/verdev.htm](http://www.arb.ca.gov/diesel/verdev/verdev.htm) .